TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35.U.S.C. 371

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U.S. APPLICATION NO: 10/048139

INTERNATIONAL APPLICATION NO	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED
PCT/NL00/00525	July 24, 2000	July 23, 1999

TITLE OF INVENTION
METHOD FOR THE MANUFACTURE OF CHOCOLATE

APPLICANT(S) FOR DO/EO/US
Kees Frederik Van Malssen, Adriaan Jan Van Langevelde, Hendrik Schenk and Rene Peschar

Applicant herewith submits to the United States Designated /Elected Office (DO/EO/US) the following items and other information:

1. [X] This is a FIRST submission of items concerning a filing under 35 U.S.C. 371.
2. [ ] This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371.
3. [X] This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(I).
4. [X] A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date
5. [X] A copy of the International Application as filed (35 U.S.C. 371(c)(2))
   a. [ ] is transmitted herewith (required only if not transmitted by the International Bureau).
   b. [X] has been transmitted by the International Bureau.
   c. [ ] is not required, as the application was filed in the United States Receiving Office (RO/US).
6. [X] A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. [X] A copy of the International Search Report (PCT/ISA/210)
   a. [ ] are transmitted herewith (required only if not transmitted by the International Bureau).
   b. [X] have been transmitted by the International Bureau
   c. [ ] have not been made; however, the time limit for making such amendments has NOT expired.
   d. [ ] have not been made and will not be made.
8. [ ] A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. [ ] An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. [ ] A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11. to 16. below concern other document(s) or information included:

11. [ ] A copy of the International Preliminary Examination Report (PCT/IPEA/409)
12. [ ] An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. [ ] A FIRST preliminary amendment.
    [ ] A SECOND or SUBSEQUENT preliminary amendment.
14. [ ] A substitute specification.
15. [ ] A change of power of attorney and/or address letter.
16. [X] Other items or information:
    a. [X] a copy of the International Search Report (PCT/ISA/210)
    b. [X] a copy of the International Preliminary Examination Report (PCT/IPEA/409)
    c. [X] PCT application No. PCT/NL00/00525 was published in English under publication number WO 01/06863 on February 1, 2001.

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INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED
PCT/NL00/00515 10/048139	July 24, 2000	July 23, 1999

17. [X] The following fees are submitted:

Basic National Fee (37 CFR 1.492(a)(1)-(5):

Neither international preliminary examination fee (37 CFR 1.482)

Nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO (1.492(a)(3)) $1,040.00

International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO (1.492(a)(5) $890.00

International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO(1.492(a)(2)) $740.00

International preliminary examination fee paid to USPTO (37 CFR 1.482) but all claims did not satisfy provisions of PCT Article 33(1)-(4) (1.492(a)(1)) $710.00

International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(1)-(4) $ 100.00

CALCULATIONS PTO USE ONLY

ENTER APPROPRIATE BASIC FEE AMOUNT =	$890.00	
Surcharge of $130.00 for furnishing the oath or declaration later than [ ] **20** [ ] **30** months from the earliest claimed priority date (37 C.F.R. 1.492(e)).	$0.00	

Claims	**Number Filed**	**Number Extra**	**Rate**	$	
Total Claims	7 - 20=	2	X $ 18.00	$ 0.00	
Independent Claims	1 - 3=	1	X $ 84.00	$ 0.00	
Multiple dependent claim(s) (if applicable)			+ $280.00	$280 .00	
TOTAL OF ABOVE CALCULATIONS =				$1170.00	
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TOTAL NATIONAL FEE =				$585.00	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). $40.00 per property +				$ 0.00	
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a. [X] A check in the amount of $585.00 to cover the above fees is enclosed.

b. [ ] Please charge our Deposit Account No. 50-1145 in amount of $___ to cover the above fees. A copy of this sheet is enclosed.

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NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

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January 22, 2002
Date

32,689
Registration No.

Method for the manufacture of chocolate

The present invention relates to a method comprising

a) the preparation of a cooled but still liquid chocolate mass which comprises i) a fat selected from cocoa butter and cocoa butter equivalents (CBE), and at least one component selected from a) sugar, b) cocoa mass and c) cocoa powder,

b) mixing the liquid chocolate mass with a seed material, and

c) allowing the mixture to cool to a first temperature below the melting temperature of chocolate, producing solid chocolate,

the seed material used in step b) being cooled mixture.

Such a method is known from the European patent application 0 765 606. This describes how chocolate mass from a vessel is subjected to ultrasonic treatment in order to form stable β polymorph crystals. A portion of the thus-treated mass is cooled and returned to the vessel.

The disadvantage of this method is that an apparatus is required for the generation of ultrasound for the removal of unstable polymorph crystals formed with the method, while in addition to this outlay also raising the energy costs during production of a chocolate product.

The object of the present invention is to provide a method according to the preamble with which the disadvantages are to large extent eliminated. It is the particular object of the invention to provide a method producing such a chocolate, which includes a chocolate product, which during prolonged storage will develop no or only a slight amount of white efflorescence (will exhibit less or no fat bloom).

To this end the method according to the present invention is characterized in that when preparing the

liquid chocolate mass, it is heated to above the critical temperature, and subsequently cooled to a second temperature between the first temperature and the critical temperature, the thus cooled chocolate mass is mixed with the seed material, the seed material used being cooled mixture at a temperature above 30°C, but which liquid substance has not exceeded the critical temperature and which substantially does not contain any crystalline material in the β' phase, and in that to produce solid chocolate, the mixture is subsequently cooled to the first temperature.

Thus a simplified method is provided for the preparation of chocolate which during prolonged storage will exhibit less fat bloom or none at all. Compared with the known method, the energy consumption is limited. In the present application the critical temperature is the temperature at which all forms of crystalline fat have changed to the molten state. This temperature may be determined by melting a sample whose fat is in the β condition (obtained, for example, by leaving molten chocolate for at least three days at a temperature of 22°C) and to heat it to a temperature X and to maintain it for one minute at that temperature. The mass is subsequently cooled to 23°C at a rate of 1°C/min. (while avoiding that the liquid chocolate mass comes into contact with a surface whose temperature is more than 3°C lower than that of the chocolate mass), and examined to see whether the β or the β'phase develops. This experiment is carried out mechano-statically. That temperature X is the critical temperature with which after cooling again solid chocolate is obtained whose crystallization phase is substantially β'. The melting point of chocolate depends to some extent on the rate of cooling during production. Moreover, the melting point is not one single value, because chocolate has a melting range of several degrees. Indications of temperature with regard to melting temperature are in the present application related to the lowest value of the melting range. For a reliable process,

the liquid chocolate mass will generally be heated to at least 2°C, preferably to at least 5°C above the critical temperature. A higher temperature shortens the time during which the chocolate mass has to be heated above the critical temperature. In the present application, the first temperature is understood to be the temperature at which molten chocolate mass is solidified. This temperature is below the melting temperature of the chocolate. The second temperature, which may also be called the mixing temperature, is suitably at least 2°C below the critical temperature and at least 2°C above the first temperature, conveniently above the melting temperature of the chocolate. Cocoa butter is preferably mixed at a temperature in the vicinity of T_{opt} obtained with the (empirical) formula:

$T_{opt} = 1.44*[St] - 3.3*[Ar]-6$

[St] being the concentration of stearic acid and [Ar] the concentration of arachidic acid as present in the free ester form in cocoa butter. When the present application refers to a substance not having exceeded the critical temperature, this means counting from the last time the substance is at least partially in a crystalline (β) phase.

As an alternative to ultrasonic treatment it is known in the art to add seed crystals to a liquid chocolate mass (Hachiya, I., et al. in Seeding Effects on Solidification Behaviour of Cocoa Butter and Dark Chocolate. II. Physical Properties of Dark Chocolate, in *J. Amer. Oil Chem. Soc.* 66:1763-1770 (1989).

Such a method has several disadvantages. First, solid chocolate has to be ground into (preferably the smallest possible) seed crystals. Second, said seed crystals should be mixed as homogeneously as possible with the liquid chocolate mass. Until now, these disadvantages have prevented the application of this method in large-scale production of chocolate, which term includes in the present invention also chocolate-comprising products such as biscuits with chocolate, and the like.

WO 98/30108 discloses a method of producing chocolate with seeding agents such as powders of stable crystals of a fat or oil, SOS, BOB, SSS, cocoa butter or extracts thereof, and other naturally occurring or synthetic triglycerides.

Preferably, in the cooling steps, the temperature of the wall (that is to ——→ page 4

say the interior wall) is suitably at most 5°C lower than the temperature of the optionally seeded or unseeded liquid chocolate mass, preferably at most 3°C lower, and most preferably at most 2°C.

This ensures that the fat in the solid chocolate will not be in the undesirable β' phase.

The preparation of chocolate has been widely researched. This has also involved fundamental research on the behaviour of its components such as the crystallization behaviour of cocoa butter. Schlichter-Aronhime, J. et al. (ref.1) described the formation of stable crystalline seed material in a melt. This may be done by alternating the temperature causing low-melting crystals to redissolve while more stable crystals are left. Hence, the method described in said (and other) publications relates to cocoa butter in non-stirred (static) conditions. The above publication does not concern a liquid chocolate mass which after all contains in addition a sweetener such as sugar and optionally cocoa powder. It is well known in the art that these factors affect the crystallization behaviour (of fat) in the chocolate. Ref. 2, for example, describes the differences between static and dynamic formation of chocolate. Refs. 3 and 4 describe the effects of other components on the formation of chocolate, and in particular that these may have a considerable effect on the same.

To start the process of a continuous production, cocoa butter may be used as the seed material, as prepared according to Ref. 5, whereas subsequently mixture cooled to approximately the first temperature but having a temperature of at least 30°C, is used as seed material.

Consequently, once production is started up, this seed material is available in liberal quantities since it can be obtained just prior to the mixture cooling to below the first temperature. In accordance with an alternative embodiment, mixture that is cooled to below the first temperature may be remelted, taking care not to exceed the critical temperature. In each of the cases the seed

material is added at a temperature lower than the critical temperature and at a temperature of at least 30°C, such as suitably at least 32°C. In practice, the seed material will be added at a temperature that is the same as, or lower than the second temperature. The temperature may advantageously be chosen such that it contributes to the further cooling of the liquid chocolate mass.

The quantity of liquid substance being added is preferably 10 - 20% by volume of the fat content of the final mixture.

Although the amount of liquid substance added as seed material may vary greatly, for example between 5 and 90%, the above-mentioned preferred range of percentages will provide a method combining a large production volume with limited sensitivity to variations in the production conditions, such as changes in the composition of components and temperature variations within the installation where the method is applied.

Prior to being mixed with the seed material, it is advantageous for the liquid chocolate mass to be cooled to a second temperature of at least 4°C below the critical temperature.

This provides a robust process that is less sensitive to temperature deviations.

Advantageously, cooling to the first temperature takes place subsequent to the addition of the seed material, at a rate of 0.2 - 3°C/min.

Preferably the method is carried out as a continuous process.

Continuous process simplifies the method to a considerable extent, especially since seed material can be added in a simple manner from downstream product streams.

According to a preferred embodiment the mixture is divided into a first relatively small stream and a second relatively large stream, wherein the first stream is cooled more slowly than the second stream and subsequently used as seed material, whereas the second stream is cooled yielding solid chocolate.

Cooling the small stream that is used as the seed material more slowly, ensures that high-quality seed material is obtained and allows the second stream to be cooled relatively quickly yielding solid chocolate with the desired qualities.

The present invention will now be elucidated with reference to the following exemplary embodiments.

Example

For all the experiments and the control experiments chocolate was prepared consisting of 9.0% defatted cocoa powder (natural, fat content < 0.5%), 35.0% cocoa butter (soft butter from Bahia, iodine value 41, having the fat composition shown in table I), 55.5% fine powder sugar and 0.5% lecithin.

TABLE I

Iodine value triglycerides fatty acids

Iodine value	Triglycerides	%	Fatty acids	%
40,7	C48	0,3	C16:0	23,5
	C50	16,4	C16:1	0,3
	C52	44,7	C18:0	31,8
	C54	36,6	C18:1	38,8
	C56	2,0	C18:2	4,1
			C18:3	0,3

The iodine value is determined by the Wijs method (IUPAC method 2.205). The triglyceride composition is determined by GLC (IUPAC method 2.323) and the fatty acid composition is determined with the aid of GLC via fatty acid methyl esters (IUPAC methods 2.301 and 2.302).

EXAMPLE I

For the preparation of 750 g chocolate the cocoa powder and the sugar were mixed, and heated to 60°C in an oven. To this mixture a portion of the warm cocoa butter is admixed, is yielding a chocolate mass with a fat content of 25%. This chocolate mass is rolled with 700-800 kPa/cm^2 at approximately 30°C in order to reduce the cocoa particles and sugar, and reheated to 60°C and mixed and again rolled, now with 900-1000 kPa/cm^2 at approximately 30°C. More cocoa butter is added such that the mixture contains 80% of the total quantity of cocoa butter. Immediately after rolling and the addition of more cocoa butter the chocolate mass is heated for 30 minutes at 60°C, yielding a liquid chocolate mass. The temperature of 60°C is 20-22°C above the critical temperature.

The remaining cocoa butter (the cocoa butter used had solidified through natural cooling, and had been stored for certainly more than three days) is molten together with the lecithin and under stirring heated to 34°C. This is done in a vessel having a wall temperature of 35°C in order to ensure that none of the cocoa butter reaches a temperature above the critical temperature.

The liquid chocolate mass is cooled to 34°C (wall temperature above 26°C) and the mixture of cocoa butter and lecithin is admixed with the liquid chocolate mass. The mixture thus obtained is cooled under stirring to 26°C in a vessel with a wall temperature of 26°C. This temperature is below the melting temperature of the chocolate (melting range 30.1-34.5°C. The thus cooled chocolate is immediately poured into moulds that have been heated to 26°C, vibrated to remove the air bubbles, and subsequently kept at 26°C for 1.5 hours. The filled moulds are then stored for 30 minutes at 10°C to facilitate the removal of the chocolate from the moulds. After removal, the chocolate is wrapped in aluminium foil.

EXAMPLE II

A quantity of material to be rolled (composition: minimum total content of cocoa 25% (of which at least 6.7%

defatted dry cocoa and at least 18% cocoa butter), at least 21.5% of milk constituents (of which at least 7.5% milk at) and at least 46% sucrose)) is heated to 55-60°C in an oven (mixture A). Subsequently it is cooled to 36°C on a water bath of 36°C.

Separately, 65.8 g of cocoa butter and 2.5% lecithin are mixed and heated to 36°C (mixture B).

Mixture A and 54 g of mixture B are combined at 36°C and cooled to 25°C. After 30 minutes material poured into moulds is cooled to 10°C.

The addition of partially cooled mixture B (or product molten again to at least 30°C) to a mixture A, results in chocolate products that exhibit the same favourable fat bloom characteristics as chocolate obtained directly from mixture A and mixture B.

References

1) Schlichter-Aronhime, J. et al. Solidification and Polymorphism in Cocoa Butter and the Blooming Problems, in *Crystallization and Polymorphism of Fats and Fatty Acids*, Surfactant Science Series, Vol. 31, edited by N. Garti and K. Sato, Marcel Dekker Inc., New York, pp. 363-393, (1988)

2) Loisel, C. et al. Dynamic Crystallization of Dark Chocolate as Affected by Temperature and Lipid Additives in Journal of Food Science 63 (1), pp 73-79, (1998)

3) Seguine, E. S., Tempering, the inside story, Manufact. Conf. 71:117-125 (1991)

4) Bricknell J. et al. Relation of Fat Bloom in Chocolate to Polymorphic Transition in Cocoa Butter, JAOCS, Vol. 75, No. 1, pp 1609-1615, (1998)

5) Adenier, H. et al., Solidification and Polymorphism in Cocoa Butter and the Blooming problems, Ind. Aliment. Vol. 4, p 315 (1978)

CLAIMS

1. A method for the manufacture of chocolate, which method comprises

a) the preparation of a cooled but still liquid chocolate mass which comprises i) a fat selected from cocoa butter and cocoa butter equivalents (CBE), and at least one component selected from a) sugar, b) cocoa mass and c) cocoa powder,

b) mixing the liquid chocolate mass with a seed material, and

c) allowing the mixture to cool to a first temperature below the melting temperature of chocolate, producing solid chocolate,

the seed material used in step b) being cooled mixture, **characterized** in that when preparing the liquid chocolate mass, it is heated to above the critical temperature, and subsequently cooled to a second temperature between the first temperature and the critical temperature, the thus cooled chocolate mass is mixed with the seed material, the seed material used being cooled mixture at a temperature above 30°C, but which liquid substance has not exceeded the critical temperature and which substantially does not contain any crystalline material in the β' phase, and in that to produce solid chocolate, the mixture is subsequently cooled to the first temperature.

2. A method according to claim 1, **characterized** in that the quantity of liquid substance being added is 10 - 20% by volume of the fat content of the final mixture.

3. A method according to claim 1 or 2, **characterized** in that prior to being mixed with the seed material, the liquid chocolate mass is cooled to a second temperature of at least 4°C below the critical temperature.

4. A method according to one of the preceding claims, **characterized** in that cooling to the first

temperature after the addition of the seed material, takes place at a rate of 0.2 - 3°C/min.

5. A method according to one of the preceding claims, **characterized** in that the method is carried out as a continuous process.

6. A method according to claim 5, **characterized** in that the mixture is divided into a first relatively small stream and a second relatively large stream, wherein the first stream is cooled more slowly than the second stream, and subsequently used as seed material, whereas the second stream is cooled yielding solid chocolate.

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(74) Agent: **ALTENBURG, Bernardus, Stephanus, Franciscus**; Octrooibureau Los En Stigter B.V., Weteringschans 96, NL-1017 XS Amsterdam (NL).

(81) Designated States *(national)*: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published:
— *With international search report.*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

WO 01/06863 A1

(54) Title: METHOD FOR THE MANUFACTURE OF CHOCOLATE

(57) Abstract: The invention relates to a method for the manufacture of chocolate, wherein liquid chocolate mass is mixed with seed material, and the mixture is cooled to below the melting temperature. According to the invention the seed material mixture is used having a temperature of at least 30 °C, and which has not exceeded the critical temperature. A chocolate manufactured in this manner will exhibit less or no fat bloom during prolonged storage.

2280-129

COMBINED DECLARATION
AND POWER OF ATTORNEY

(Original, Design, National Stage of PCT, Divisional, Continuation or C-I-P Application)

As a below named inventor, I hereby declare that:
My residence, post office address and citizenship are as stated below next to my name; I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

METHOD FOR THE MANUFACTURE OF CHOCOLATE

This declaration is of the following type:

[] original
[] design
[X] national stage of PCT/NL00/00525.
[] divisional
[] continuation
[] continuation-in-part (C-I-P)

the specification of which: *(complete (a), (b), or (c))*

(a) [] is attached hereto.
(b) [X] was filed on 1/22/02 as Application Serial No. 10/048,139 and was amended on *(if applicable)*.
(c) [] was described and claimed in PCT International Application No. _____ filed _____ on and was amended on *(if applicable)*.

Acknowledgment of Review of Papers and Duty of Candor

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the patentability of the subject matter claimed in this application in accordance with Title 37, Code of Federal Regulations § 1.56.

[] In compliance with this duty there is attached an information disclosure statement. 37 CFR 1.98.

Priority Claim

I hereby claim foreign priority benefits under Title 35, United States Code, § 119(a)-(d) of any foreign application(s) for patent or inventor's certificate or of any PCT International Application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT International Application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application on which priority is claimed

(complete (d) or (e))

(d) [] no such applications have been filed.

(e) [X] such applications have been filed as follows:

PRIOR FOREIGN/PCT APPLICATION(S) FILED WITHIN 12 MONTHS (6 MONTHS FOR DESIGN) PRIOR TO SAID APPLICATION			
COUNTRY APPLICATION NO.	DATE OF FILING (day, month, year)	DATE OF ISSUE (day, month, year)	PRIORITY CLAIMED UNDER 35 USC 119
			[] YES NO []
			[] YES NO []
			[] YES NO []
ALL FOREIGN APPLICATION(S), IF ANY, FILED MORE THAN 12 MONTHS (6 MONTHS FOR DESIGN) PRIOR TO SAID APPLICATION			
Netherlands 1012691	July 23, 1999		[X] YES NO []
			[] YES NO []
			[] YES NO []

Claim for Benefit of Prior U.S. Provisional Application(s)

I hereby claim the benefit under Title 35, United States Code, § 119(e) of any United States provisional application(s) listed below:

Provisional Application Number	Filing Date

Claim for Benefit of Earlier U.S./PCT Application(s) under 35 U.S.C. 120

(complete this part only if this is a divisional, continuation or C-I-P application)

I hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s) or PCT international application(s) designating the United States of America that is/are listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior application(s) in the manner provided by the first paragraph of Title 35, United States Code § 112, I acknowledge the duty to disclose information as defined in Title 37, Code of Federal Regulations, § 1.56 which occurred between the filing date of the prior application(s) and the national or PCT international filing date of this application:

(Application Serial No.)	(Filing Date)	(Status) (patented, pending, abandoned)
PCT/NL00/00525	July 24, 2000	pending

Power of Attorney

As a named inventor, I hereby appoint Gerald Levy, Reg. No. 24,419; Ronald E. Brown, Reg. No. 32,200; Marta E. Delsignore, Reg. No. 32,689; John Gulbin, Reg. No. 33,189; Lindsay Adams, Reg. No. 36,425; and Michael P. Stanley, Reg. No. 47,108, of the firm of Pitney, Hardin, Kipp & Szuch, with offices at 685 Third Avenue, New York, New York 10117-4024, as attorneys to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith.

SEND CORRESPONDENCE TO:	DIRECT TELEPHONE CALLS TO:
Pitney, Hardin, Kipp & Szuch 685 Third Avenue, New York, NY 10017	Pitney, Hardin, Kipp & Szuch (212) 297-5800

2280-129

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

FULL NAME OF SOLE OR FIRST INVENTOR	LAST NAME Van Malssen	FIRST NAME Kees Frederik	MIDDLE NAME	
RESIDENCE & CITIZENSHIP	CITY Desborough GBX	STATE or FOREIGN COUNTRY United Kingdom	COUNTRY OF CITIZENSHIP ~~United Kingdom~~ The Netherlands	
POST OFFICE ADDRESS	POST OFFICE ADDRESS 54 Pioneer Avenue	CITY Desborough	STATE or COUNTRY United Kingdom	ZIP CODE NN14 2PA
DATE 13-09-2002	SIGNATURE OF INVENTOR			
FULL NAME OF THIRD JOINT INVENTOR, IF ANY	LAST NAME Van Langevelde	FIRST NAME Adriaan Jan	MIDDLE NAME	
RESIDENCE & CITIZENSHIP	CITY NG Almere NLX	STATE or FOREIGN COUNTRY The Netherlands	COUNTRY OF CITIZENSHIP The Netherlands	
POST OFFICE ADDRESS	POST OFFICE ADDRESS Max Takstraat 41	CITY NG Almere	STATE or COUNTRY The Netherlands	ZIP CODE NL-1325
DATE 02-09-02	SIGNATURE OF INVENTOR			
FULL NAME OF FOURTH JOINT INVENTOR, IF ANY	LAST NAME Schenk	FIRST NAME Hendrik	MIDDLE NAME	
RESIDENCE & CITIZENSHIP	CITY AK Zaandijk NLX	STATE or FOREIGN COUNTRY The Netherlands	COUNTRY OF CITIZENSHIP The Netherlands	
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DATE 27-08-02	SIGNATURE OF INVENTOR			
FULL NAME OF FIFTH JOINT INVENTOR, IF ANY	LAST NAME Peschar	FIRST NAME Rene	MIDDLE NAME	
RESIDENCE & CITIZENSHIP	CITY AL Amsterdam NLX	STATE or FOREIGN COUNTRY The Netherlands	COUNTRY OF CITIZENSHIP The Netherlands	
POST OFFICE ADDRESS	POST OFFICE ADDRESS C. Drebbelstraat 24 II	CITY AL Amsterdam	STATE or COUNTRY The Netherlands	ZIP CODE NL-1097
DATE 27-08-02	SIGNATURE OF INVENTOR			

Check proper box(es) for any added page(s) forming a part of this declaration

- [ ] Signature for ninth and subsequent joint inventors. Number of pages added _____.
- [ ] Signature by administrator(trix), executor(trix) or legal representative for deceased or incapacitated inventor. Number of pages added _____.
- [ ] Signature for inventor who refuses to sign, or cannot be reached, by person authorized under 37 CFR 1.47. Number of pages added _____.